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Nov 14, 1962

UNITED STATES DEPARTMENT OF AGRICULTURE
Economic Research Service

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MARKETING AND NEW PRODUCTS

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Talk by Philip B. Dvoskin
Marketing Economics Division

CURRENT SERIAL RECORDS

at the 40th Annual Agricultural Outlook Conference
Washington, D. C., 4:15 P. M., Wednesday, November 14, 1962

I appreciate the invitation to talk once more with you about our marketing economic research activities and the new product developments of utilization research. It is fitting, in my opinion, that this topic be presented as part of the Family Living Sessions, which is the consumer oriented part of the Outlook Conference. Most of the research activities which I will discuss have been selected with the interest of the consumer in mind. It is generally accepted that the Outlook Conference is conceived and dedicated to the proposition that economists and statisticians can provide the necessary economic intelligence for farmers to allocate resources in such a manner as to maximize their incomes. Similarly research done by marketing economists can provide consumers with marketing intelligence to enable them to allocate their income in such a manner as to maximize satisfaction from the billions they spend for food.

As I indicated to you last year, a substantial part of the marketing economics research program is devoted to market research studies that help the farmer, the processor, and the dealer of agricultural products. In addition to market potentials research which evaluates the economic feasibility and market expansion possibilities of new and improved agricultural commodities, these include commodity studies of interregional and intermarket competition; margins and costs for marketing agricultural commodities; market structure and costs research; research studies to improve the farmers' bargaining power in the marketplace; and market development research which includes studies evaluating promotion and merchandising of agricultural commodities, as well as public programs involved in the distribution of food, such as school lunch.

The estimated marketing bill for 1961 represents an increase of almost 75 percent in eleven years since 1950. Since marketing studies are focused on ways of improving the marketing system and reducing marketing cost--which is currently running at about two-thirds of consumer expenditures for food, or about \$42 billion--they are in the interest of all groups in the economy, including consumers. This is the kind of research that oils the squeaks that develop in even our amazingly efficient marketing system.

I have been talking about farmers and consumers as if they are two mutually exclusive groups. This is not the case. Let us remember that farmers are also consumers. With our farm population becoming more and more dependent on purchased rather than homegrown foods, it is obvious that in either role the farmer benefits from a more efficient marketing system.

It is difficult to talk about our marketing system without using glittering generalities. The food and allied industries can be proud of their achievements. Anyone who walks into today's modern, clean, spacious supermarkets can't fail to be impressed at the vast array of items displayed and the reasonable prices tagged on these items. All this, with piped-in music, kiddie corners, parking lots, and trading stamps thrown in. Whenever I say this, the usual reaction is: "Yes, we have all these fine things, but they are not free; we are really paying for them." Let's examine this allegation in more detail.

American consumers on the average spend about 20 percent of their disposable income for food. By contrast, even in some of the advanced economies of Western Europe the average expenditure for food is about a third of their incomes. In underdeveloped economies the contrast is even more noticeable. For example, in Nigeria it is estimated that 70 percent of the family income goes for food. While it is true that if U.S. consumers had bought the same food and services as they did in 1935-39, they would have spent only 14 percent of their income, instead of 20 percent, on food this increase of 6 percentage points does not represent entirely increasing services and costs of these services. To a considerable extent it represents an upgrading of diet, that is a shift to higher cost and perhaps more satisfying foods.

In spite of the shift to a higher cost diet, the American consumer still is paying a far smaller portion of his income for food than his foreign counterpart, as well as less than any consumer in American history. For example, to earn a pound of butter the average American worker works 20 minutes--the Russian worker, 193 minutes. A pound of rice costs an American 5 minutes of work--a Japanese, 25 minutes. In 1929, an hour of U.S. factory labor bought only 1.2 pounds of round steak, while today it buys 2.2 pounds. It bought 4 quarts of milk then--9 quarts today; 15 oranges then--37 today. More facts and figures are available, but it all adds up to the same conclusion. The American consumer is reaping the benefits of living in a highly mechanized, technologically oriented society and the agricultural sector, by providing the tremendous abundance of food and fibers, is playing a significant part in enabling the American consumer to lead the affluent life.

We have made a study of the comparative costs of convenience foods to consumers. The results of this study bear out in part the contention that increase in the percentage of income spent for food is not entirely due to increased services. It points out that increasing costs of services, as they relate to maid service built into food by processing, is not an important factor in rising food costs of the postwar period. Rather the cost of adding convenience to foods is minimal in nature compared to other costs such as rents, labor, transportation and housing. We found that the convenience foods, and by "convenience foods" we mean those foods that have undergone some preparation ordinarily done in the home, are not exotic type foods such as cheese blintzes and the like usually considered by many as convenience foods. Instead, we found that many important convenience foods had a cost-decreasing effect on consumer expenditures. These were such foods as frozen concentrated orange juice, instant coffee, frozen lima beans, canned spaghetti, and cake mixes such as devils food. (fig. 1)

On the other hand, most of the convenience food items we priced in the study--116 out of 158--were more expensive than the fresh or home-prepared counterparts. The higher prices for many of these conveniences are due in large measure to their extremely low volume of sales. Also some convenience items such as frozen TV dinners, are not amenable to production with automatic equipment. We are told by food processors that unit labor costs are high because of the necessity for individual handling of each dinner. In some instances the method of processing or the expensive packaging requirements, or both may account for some of the higher prices. This is particularly true for dehydrated foods. (fig. 2)

As noted earlier, high sales volume is correlated with lower prices for most of the 42 products that were found to be less expensive than the fresh or home-prepared items. This is understandable since higher sales volume, coupled with the many cost advantages of large scale production accruing to factory-prepared items, is a potent combination for partially offsetting the added costs of processing and packaging. Other factors that contribute to making some processed foods cost less than their nonprepared equivalents are the following: (1) Most processed foods are prepared when raw material supplies are in season and are most abundant and cheapest; (2) Processed products are more stable, less perishable, in some instances less bulky, and have greater uniformity than is true of fresh products. These factors bring about considerable savings in handling, transportation, and storage; and (3) Many of the products like cake mixes, frozen concentrated orange juice and the like are processed and packaged in vast quantities, making the production and handling costs per package extremely low.

One other point on this study which I believe will be of interest: Probably the most useful by-product emerging from the research on convenience foods will be the comprehensive and objective yield information developed for the various forms of the same food. Heretofore, accurate comparisons on per servings of these various foods could not be made because data for many of the processed foods were not available. In our final report, data will be available to allow accurate comparisons to be made for a large number of processed food items. This should prove a boon to economy-minded shoppers who often can discover savings by comparing the cost per serving of various forms of the same foods.

Another study of interest to consumers is our work on freeze-drying. Freeze-drying is a process wherein foods are dried under vacuum in the frozen state; the water passes off as a gas, leaving a sponge-like structure which has lost 85 percent of its weight, but not its bulk, with excellent rehydration and flavor characteristics. Last year I mentioned that this work just was getting underway. Today I have some preliminary results to pass along to you relating to one phase of the project--an evaluation of flavor acceptability by an expert taste panel of selected freeze-dried products and commercially available counterparts, usually a processed form. 1/ As you know, objective

1/ Bird, Kermit. "Freeze-Drying Expectations," Talk presented at the American Society of Heating, Refrigerating and Air Conditioning Engineers' Meeting, Hershey, Pa., Oct. 26, 1962.

expert taste panel evaluation is an important step in the development of a new product. These evaluations were accomplished by the Food Quality Laboratory of Agricultural Research Service. Altogether 30 freeze-dried products were evaluated. The six products discussed here (hamburger, chicken pieces, scrambled eggs, shrimp, peas, cream of mushroom soup) were selected to give a sampling of some of the more important commodity groups.

Now remembering that the only characteristic shown here is flavor, let us examine several of the products and see how they compare with the standard, usually the commercially available frozen or canned form. (fig. 3) It appears that on the basis of flavor alone, freeze-dried products, except for cream of mushroom soup and hamburger, were rated below their commercial counterparts. Obviously final judgement on comparative acceptability of freeze-dried products should await the full report, but some tentative conclusions can be drawn from the panel evaluation. These are: (1) The freeze-drying process, from a flavor standpoint, works better on some commodities than others; (2) In view of the overall results, the future of freeze-drying may lie in the direction of complete ready-to-serve dishes or entrees rather than as separate ingredients; and (3) The considerable quality variations found among brands indicate that an individual company's know-how in freeze-drying processing techniques may be an important determinant of product quality.

Let us turn now to market research studies of specific commodities and related new product developments. While none of the new product developments are particularly new in the sense that many of them have been previously discussed by myself and others in the Department, we do have some relatively fresh study results which may be of interest. These findings and new product developments will be discussed under specific commodity headings.

Dairy products research.--In our work in the dairy field, a study of the causes and effects of milk price wars has brought to light information to consumers. Some price wars appear to encourage greater concentration of control of markets by putting a financial squeeze on smaller firms. In other instances price wars seem to act as a stimulus to competition by helping to bring cost-reducing innovations such as lighter or larger-sized containers, or quantity discounts to households on home delivery routes. A case in point illustrates what a group of determined consumers can do. In the Hartford-New Haven area of Connecticut, a group of housewives took the lead in changing State laws which prevented the use of gallon and half-gallon containers. The general competitive stimulus which followed the legalizing of these containers encouraged dealers to introduce other economies in the distribution of milk to both stores and homes. As a result of this general streamlining of operations, an area of exceptionally high milk prices became one where milk prices were considerably more attractive to consumers.

Changes in consumers' purchasing habits, combined with competition from other products are significant factors in the declining per capita consumption of fluid milk. This decline, coupled with increased farm output of fluid milk, has created a serious surplus problem. However, one bright spot in the fluid product field appears to be low-fat milk. We have underway a study designed to measure the effect of sales of low-fat milk on sales of whole milk and skim milk in selected areas, as well as the market potential for the

product in areas where it is not currently sold. With the excellent cooperation from the Milk Marketing Orders Division of ASCS, sales statistics for the product are now being collected in most of the milk order markets where the product is being sold. These statistics indicate that low-fat milk is a much more significant factor in fluid milk sales than anticipated. In several markets low-fat milk accounted for as much as 15 percent of total fluid milk sales. In these markets we find that the low-fat product previously reported in the skim milk category has been a primary factor in the increase in skim milk sales. These volumes indicate to us that this product is the type of fluid milk product wanted by a considerable number of household consumers. Our study will determine the extent of such wants and the possible economic effects the introduction of this product on a wider scale may have on milk consumption on one hand and dairy producers' returns on the other.

Fruit and vegetable research.--We recently completed a test of sweetpotato flakes in Cleveland and New Orleans restaurants and other types of institutional outlets. The research results indicate a highly favorable reaction to instant sweetpotato flakes by management, kitchen help and customers. The potential for the product developed by the Southern Regional Laboratory appears to be sizeable. We found that when sweetpotato flakes were offered on the menu, 20 to 25 percent of the customers ordered them and their reaction was extremely favorable. The main emphasis of the research was focused on kitchen preparation of the product. Through personal interviews and observations of preparations for actual meal situations, it was found that operators' favorable reaction to sweetpotato flakes was based on the fact that they were easy to prepare, saved time and labor, and added variety to menus.

Some of the more interesting products we are planning to put in a testing situation in the near future are instant bean, pea and lentil powders, developed by the Western Regional Laboratory. The powders are very easy to use. Soups can be prepared by merely stirring the powder in hot water to give the consistency desired. The products also are versatile. The bean product powder, for example, can be used not only as soup but as fried bean cake, dips, croquettes, casseroles, meat stuffing, and the like. In the production process the beans or peas are scalded briefly, soaked overnight and cooked in the soak water. They are then pureed in equipment that forces the material through perforations in a metal plate. The product is then ready for dehydration. The powder can be ladled out for one serving or for as many as the homemaker prefers. Thus the bean, split pea and lentil also have joined the instant family.

The work on instantizing fruits and vegetable pieces is making good progress at the Eastern Laboratory. A process analogous to the puffing of cereals is being developed. The process has been successfully applied to potatoes, beets, carrots, green corn, and apples. It entails conventionally drying vegetable or fruit pieces with hot air to about 45 percent moisture. The drying is then interrupted and the pieces are momentarily heated to super-atmospheric pressure. When the pressure is suddenly released, a small percentage of the moisture flashes into vapor, thereby creating a porous structure. This enables a greatly accelerated rate of drying by conventional means. The major advantage, however, is in the greater ease of rehydration. The products resulting require only 5 to 6 minutes simmering, in contrast to the 20 - 60 minutes necessary for conventionally dried pieces of the same size. The process

will make available relatively large pieces for various dehydrated soup mixes without any increase in time for reconstitution. It will also make available dried fruit pieces with a potential use in cereal and cake mixes.

In the dehydrated potato field there has been a development of interest. The Eastern Lab has further refined the potato flake into another form of mashed potatoes known as potato flakelets. As the name indicates, the product has all the virtues of its bigger brother flakes, but in addition has a considerably greater density. This of course makes for more product per package and thereby reduces packaging costs.

There have been some important research developments concerning measurements of onion flavor. A chemical test for pungency has been developed. This work at the Western Laboratory will allow manufacturers of onion products and all those who use onions in formulated food products to use the onion with the proper flavor and odor. What this means to consumers is that they will get a more flavorful, tasty product than would otherwise have been the case.

Also Western Lab researchers have been successful in developing a stabilized raisin for dry cereal products. One of the real problems of prepared breakfast food flakes containing raisins is that the shelf life is shortened by transfer of moisture from fruit to cereal. Eventually the flakes lose crispness and the raisins become hard and less palatable. A moisture impervious film using an edible coating of bees' wax offers considerable promise for a stabilized raisin, and for an expanding market for raisins in dry cereal products.

Last year I reported to you quite extensively on the Utilization Laboratories' process developments concerning essence-flavored superconcentrates and powders, dehydrofreezing and foam-mat drying. On the dehydrofrozen side, it appears that apple slices which we tested in three major eastern markets, are a rapidly growing commercial product, particularly in pie baking. While on the subject of apples, I might say that superconcentrated apple juice, another product we tested in Fort Wayne in recent years, is about ready to make its commercial debut. Dehydrofrozen peas are in commercial production and the demand for this product is growing rapidly. Dehydrofrozen potatoes appeared on the retail market this year.

For the foam-mat process, work is continuing on several interesting products such as tomato and orange juice. We hope to have the orange juice product in a testing situation in the near future.

Egg products.--Prospects for the development of an egg solids powder, instantly dispersible, with good stability and fresh-like flavor, plus being salmonella free, are good. Researchers in industry and at the Western Lab have successfully applied several different methods of instantizing egg solids. These are an agglomeration of spray-dry powders, forced air drying of mechanically pre-formed foams (fluff drying) and gas impregnation prior to spray-drying. All three methods yielded powders of dispersibility strikingly improved over conventional spray-dried powders, without impairing functional properties. The technique of gas impregnation of egg solids prior to spray-drying is somewhat like the methods used in making instant coffee and tea. However, the

specifics and methods of applying the idea of gas impregnation prior to spray drying were conceived by the Western Laboratory researchers.

Industrial uses of agricultural commodities.--The development of new and improved industrial uses of agricultural commodities and the search for new crops to provide products for industrial use has received increasing attention in recent years by the Department's scientists. We have a group in our Market Potentials Branch whose sole efforts are devoted to assessing the economic feasibility of these research efforts and providing guidelines to assist in the physical research programs of the Department. Although this is a food session, I have selected two specific areas of work which I believe would be of interest to this group. First I would like to tell you a little bit about the Western Lab's work on wool and a related marketing research project underway. The Wool and Mohair Laboratory of the Western Division has patented and developed the interfacial polymerization "wurlanizing" treatment for wool. This IFP treatment prevents shrinkage of wool fabric. Wool fabric processed in this way thus can be safely laundered in the home washing machine. Obviously apparel manufacturers and retailers have indicated a strong interest in such homelaunderable wool products. Our research in this area is aimed at determining the possibilities of expanding wool consumption in those apparel lines where the features of homelaundability are likely to be beneficial. Interviews presently are underway with garment manufacturers and retailers. This process for treating wool fabric, once it is commercialized, could enable wool to compete more effectively with other fibers.

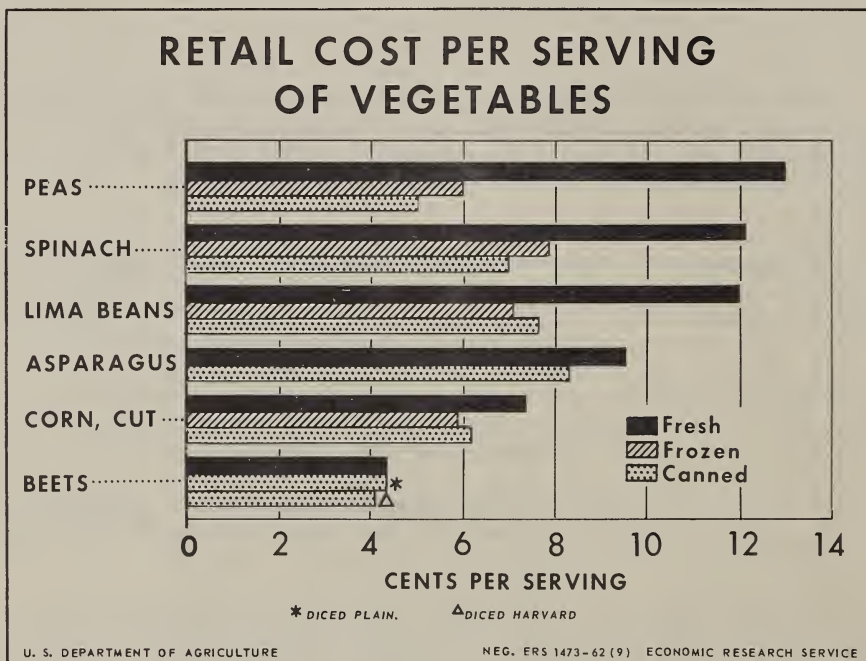
A new crop whose oil may have, among other things, potential application in the food film packaging industry, is Vernonia or Indian iron weed or purple fleabane. The crop's oil contains about seventy percent of epoxy fatty acid currently obtained at relatively high cost by chemical modification of tallow or soybean oil for use in plastic formulations, protective coatings and other industrial products.

Thus far, plantings in several states have indicated that Vernonia is adapted to a wide variety of environmental conditions. Plantings of seeds in April in Nebraska, began blooming in about eight weeks and continued to flower throughout the summer. Similar plantings in North Carolina and Texas have indicated the adaptability of this plant. Research activities concerning cultural requirements and production factors have been assigned to the Crops Research Division of ARS and the State Experiment Stations. The developmental research on seed oils containing chiefly epoxy fatty acids components has been assigned to the Eastern Laboratory of ARS. The determination of the economic feasibility of the new crop, particularly in terms of potential markets and future selling prices, is the responsibility of the Marketing Economics Division. Vernonia is only one of several new crops undergoing investigation at this time.

One final word--earlier in my talk, I extolled the virtues and the efficiency of the food industry in this country which has been described by many as the miracle of food distribution and the like. Let us remember one thing, that playing an important role in this so-called miracle, aided and abetted by the availability of new and improved technology, is the American farmer, himself. You in this group who deal daily with the American consumer,

both on the farm and in the cities, are well aware of the fact that the public image of the American farmer has not been too good. He carries the stigma of surpluses, subsidies, and the like, rather than the laureate of bountiful provider that he is. Perhaps you can point out to your clients in simple terms that the farmer, not the consumer, bears the burden of abundance. What this means is that the pressure of supply in a situation of abundance creates low prices at the farm level, whereas in a situation of scarcity, the pressure would be on consumers and they would be paying considerably higher prices for food. For example, if food prices had increased in the postwar years at the same rate that other components of the cost of living index have, such as transportation, labor, and rent, the American consumers would have spent in 1961, \$10 billion more than they actually did. When you compare this amount with the total cost of our farm program for 1961, or for that matter farm income for that year, it is obvious that the farmer has been unfairly stigmatized in the postwar years.

As our Lyle Webster put it in a recent article in "Plant Food Review," "Any way you look at it, the U.S. farmer is a success story. Let's help tell this success story, not alone for ourselves but for the world. Let's tell the world that while racing for the moon is desirable, no number of Vostoks can gloss over the need for plentiful food production. The race for plenty, not only for ourselves, but for the world, is the important goal. We do have a man in orbit--he is the man who feeds us."



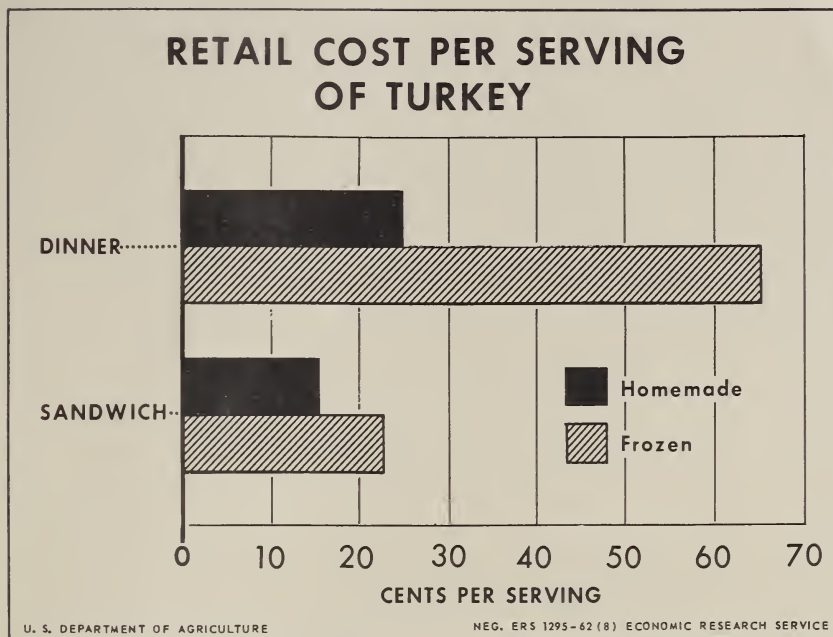


Figure 2

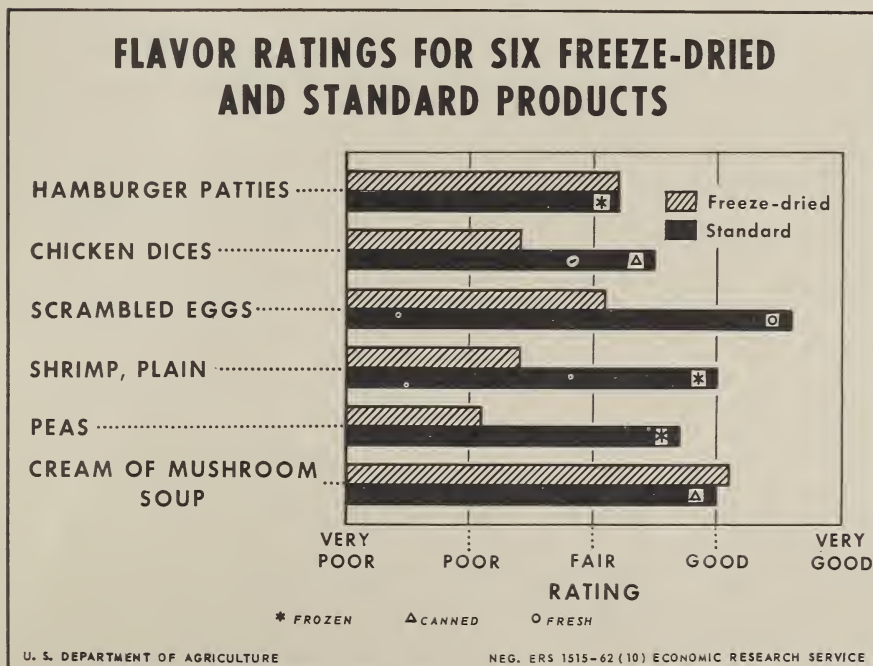


Figure 3

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Nov. 20, 1963

MARKETS AND NEW PRODUCTS

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Talk by Philip B. Dwoskin
Marketing Economics Division
at the 41st Annual Agricultural Outlook Conference
Washington, D. C., 10:15 A. M., Wednesday, November 20, 1963

This has been another good year for the American consumer. Except for a frigid blast at the citrus belt mother nature collaborated with the farmer again to produce an abundance of food and fiber. Add to this abundance food prices that have been fairly well in line with last year, another increase in disposable incomes and you have good news. This is illustrated by the fact that the percent of income spent for food continues to decline, down from 23 percent in 1953 to an estimated 19 percent in 1963. (fig. 1) ^{1/} When you compare what we spend for food with the proportion of income devoted to food even by the highly developed Western European economies, roughly a third, the well being of the U. S. consumer is even more notable.

Other evidence that this has been a good year for consumers are the several congressional activities relating to investigations of drugs and drug prices, pesticides and the so-called truth-in-packaging and truth-in-lending hearings. All of these activities focus on the well being of the consumer. In addition, a recent action by the Department reflects its awareness of the growing power of the consumer. This is evidenced by the appointment of an Assistant Secretary, whose area of responsibility has the newly coined name of, Marketing and Consumer Services.

There is however, some doubt in my mind as to how good a year this has been for the farmer, but I shall leave the specifics of such an appraisal to my colleagues speaking at the General and Commodity Sessions of this Conference.

Basic trends in food consumption.--Before turning to my assigned topic new food products, let's first orient ourselves about the outlook for the food industry by taking a look at some of the basic trends affecting food consumption. Probably the most important factor influencing food consumption in our highly developed technological economy is population and its growth. As you know we recently have passed the 190 million mark in the U. S. and the Census Bureau's latest projection calls for our population to reach 245 million by 1980, about 30 percent above the present number. This means that there will be about 55 million more people consuming an average of about 1400 pounds of food a year. In this regard, an item of some importance is that, beginning in the late 60's, the projected population will have a sizeable increase in the 15 to 19-year-old age group. This group is expected to increase 50 percent which means about

^{1/} "Consumer Expenditures for Food," Marketing and Transportation Situation, p. 13, August 1963, ERS, USDA.

9 million more teenagers than we have today. If I may inject a personal observation, based on an admittedly small sample of teenagers in my family, there is no doubt those 9 million extra teenagers will have a strong positive effect on total food consumption. Offsetting this "guesstimated" consumption increase somewhat will be a larger proportion of senior citizens in the projected population composition. In any event these anticipated changes in the size and age composition of our population will contribute to an increasing total demand for food in the years ahead. (fig. 2)

We also can expect that the kinds of foods consumed and the form in which foods are bought will continue to change and change markedly as they have in the past. Looking at the long term trend it is obvious that people are eating more meats and poultry products, processed fruits and vegetables and some dairy products per person than in 1909-13. The shift has been away from fresh fruits, fresh vegetables, cereals, sweetpotatoes, and potatoes. You will note though that potatoes on the chart shows a slight movement upward since 1959. We take some pride in this since our work on potato flakes, a form of dehydrated mashed potatoes, has been important to this upward movement. (fig. 3)

In addition there are many other important factors creating a favorable outlook for food, particularly for those food products falling into the convenience category. More women working, increases in discretionary income, more knowledge about nutrition, higher educational levels, plus the continued flow of new products, should help keep food sales rising in the decade ahead. An item of interest to consumers is contained in our recently ~~released~~ convenience food study which indicated that while most convenience foods were more ~~expensive~~ than home-prepared items the comparatively small number of less expensive convenience foods, that housewives buy in volume, actually reduce total expenditure for food. Now as some of you know, our convenience food study was based on 1960 retail prices obtained in chain and independent supermarkets. We have taken a check of these same items and found that the same relationships (i. e., cost-saving of convenience vs. home-prepared items per \$100 expenditures for all foods) still held true this fall. These findings are tentative at best since prices were obtained in supermarkets in only one market, Washington, D. C. (table 1)

Research and development and the food industry.--The food industry also has had a good year. Although net profits are down a bit, this has been another record sales year for the food industry. There is general agreement that new food products have played an important part in generating this record sales level as well as in bolstering a slightly sagging level of profits. In addition we can credit, in part, innovations in food processing with providing the impetu for our modern system of production and marketing of agricultural products. However, in the past year or so, despite the impressive contributions of innovation, there have been some doubts raised about the value of the increasing amounts being spent on research and development. These doubts have been reinforced by the fact that despite a tripling of research and development expenditures since 1952, our rate of economic growth has crept along at a comparative snail's pace. 2/

2/ "Why So Few Really New Products," Joyce, Walter, Printers Ink, February 1, 1963.

The recently released preliminary report of the National Science Foundation provides some interesting insights as to where the R and D dollar is being spent. 3/ In 1962, industrial firms accounted for nearly three fourths of the nation's total research and development performance of about \$16 billion. Although more than half of the total industrial research and development funds were federally financed, the interesting statistic, as it concerns the consumer, is that the food industry, the largest industry in the United States from a sales point of view accounted for less than 1 percent (\$108 million) of the total R and D performance. Of course, as expected, space and defense industries used 60 percent of the R and D funds. Most of the possible applications developing from such research activities will be in the industrial area.

Perhaps the present level of expenditures for research and development represents all that can be efficiently used in this research area by the food industry. On the other hand, it may be that if the disparity in R and D outlays by the food industry compared to other groups continue we can look for further encroachments by nonagricultural source materials not only in the industrial and fiber area but in the food area as well.

New packaging developments.--Some of the expenditures for research and development in other industries probably will have some useful applications in the food area. We are all acquainted with the squeeze food tubes used by our astronauts in their space flights. One company already has made application of these squeeze food tubes to the baby feeding area. An aluminum squeeze tube has been fitted with a hollow handled plastic spoon which can be attached to the neck of the tube. Presto! You have what appears to be a convenient and highly imaginative package for feeding infants or bedridden patients. According to a recent issue of Food Technology, an aluminum food tube filled with applesauce is moving into a market test. 4/ The same article reports some other interesting packaging developments in the food product and beverage field. The development of the easy to open can for beverages, an improved thin tin can and the development and improvement of aluminum containers appear to be giving the metal can a new lease on life in the food field. However competition remains keen with improved glass containers as well as plastic and paper packaging materials also being developed rapidly.

The Department's own Southern Laboratory has been doing some interesting work in developing edible coatings for food products. While this has been talked about for many a year, some of the newly modified fat products developed at the laboratory show promise in the edible packaging field.

3/ Research and Development in American Industry 1962, National Science Foundation, No. 40, Washington, D. C., September 1963.

4/ "Technical Problems Presented by New Containers and Materials," Brighton, K. W., Riester, D. W., and Braun, O. G., Food Technology, September 1963, Vol. 17, No. 9.

New food product developments.--The emphasis in product development will continue to be in terms of concentration of products. A large share of the concentrate output will continue to be produced by the already established methods of freezing, dehydration and canning but an increasing share of the output will include new methods of dehydration or combinations of dehydration and freezing. Dehydro-freezing, foam-mat and vacuum puff drying and freeze drying are examples. These increases will come about as production costs are reduced and product quality is improved. Part of the impetus for this growth of new dehydrated products will come from the prepared food manufacturers themselves who are continually looking for satisfactory new forms of ingredients that will enable them to produce new combinations of food at a lower cost. This aspect is related to the trend in the food industry toward products with built-in chef as well as maid service using exotic recipes prepared in the factory. High incomes also have resulted in more restaurant eating, but mass feeding operations have been affected by higher wage rates and higher costs which in turn have resulted in a growing demand for portion controlled foods which can be produced in centralized kitchens. In other words, processed foods are apt to be the forerunner of automation in the food manufacturing and service industries. But the greatest incentive for new product development relates directly to consumer demand. It is being bolstered continually by increasing amounts of disposable income available to buy convenient, ready-to-eat, high quality food products. In addition, we must remember that changing consumer tastes and preferences, changes in the age and ethnic composition of the population and changes in attitudes regarding the status of certain foods such as potatoes also contribute to the upward trend in new food product developments.

The Western Laboratory has made considerable progress in developing some new food concepts as well as moving closer to commercial conditions for some of the products mentioned in my earlier talks at the Family Living Sessions. On the new side the Western Lab has developed a gelled applesauce similar in appearance and consistency to cranberry sauce. It may be served in the same way as cranberry sauce, and is particularly good with pork. Also the can can be warmed and when this applesauce turns to liquid it can be poured into a food mold over pieces of fruit, berries, vegetables, nuts, raisins or meat. This product could provide an additional outlet needed for the increasing quantities of processing grade apples available in the Pacific northwest.

A nonsetting raisin paste may soon join fig paste as a filling in newtons and other bakery products. Also of interest to the raisin industry and the entire dried fruit industry is DBD a new method of artificially drying fruit. The DBD refers to the sequence of operations used dry-blanch-dry. These fruits have excellent flavor and color. Some resemble their sun dried counterparts, but most important the method produces excellent quality products and also reduces product loss by relieving sanitation problems encountered in sun-drying. The process also extends drying to fruits which have not been too successfully dried by sun-drying. This is particularly true of peaches. Although the DBD process costs are higher than sun-drying, the advantages may in time offset the cost factor in selected uses. And thus, it could provide the various dried fruit industries with new outlets for their products.

Our colleagues in the West still are working on our old friend wheat bulgur and have recently developed a new process for making instant bulgur by puffing. The method, similar to the one used by the Eastern Laboratory for

fruit and vegetable pieces, will make it possible to produce a line of dry bulgur products as convenience foods or to use it as an ingredient in easy to prepare dishes.

A frozen avocado salad similar to a fresh avocado recipe known as guacamole in Mexico, has been developed by the Southern Laboratory. This product was developed in an effort to find a processing outlet for avocados that are unsuited for fresh markets because of blemishes or other defects but whose interior is otherwise sound. The product does show considerable promise, mainly because it fits into the growing trend toward convenience foods in the institutional and household markets. The Southern Lab also has been working strenuously on its foam-mat orange juice powder in trying to improve its flavor and stability. Work also is underway on a foam-mat dried grapefruit juice powder. These powders have possibilities both in the domestic and in foreign markets.

Use of dehydrated egg products will increase in importance as their functional properties are improved, they are particularly helpful in reducing plant costs and waste in food manufacturing plants. Fool-proof methods of destroying salmonella could lead to greater use of these egg products in such convenience foods as prepared omelet mixes. As a matter of fact, last month at the Food Editors Conference in Chicago, an announcement was made about the introduction of instant omelet mixes. This product will use a blend of freeze dried ingredients and dehydrated whole egg solids that will require no refrigeration. 5/

Our work on the market possibilities for frozen bakery products indicates that the freezing preservation of bakery products will grow in importance, as a means of achieving reductions both in bakery production and in distribution costs. The frozen products permit, less frequent production and local distribution and large centralized plants that ship to distant markets.

We have work underway to determine acceptance and market potential for varying levels of fat and solids in beverage milk. We are doing this work to throw some light on the possibility of expanding consumption of fluid milk by manipulating the solids content.

Instant sweetpotato flakes, which we discussed in some detail last year are now a commercial reality. There are now two plants producing sweetpotato flakes, at least one more in the final stage of construction. Up to now distribution of the product has been limited almost entirely to the food service industry, particularly restaurants. Introduction into the retail market appears to be fairly near at hand. We are conducting several small scale research operations to give us some insights into the relative acceptability of different package types in supermarkets.

The outlook.--The emphasis on food processing innovations is going to have a marked effect on various sectors of the food industry. For example, more refrigerated and freezer space will be required in the supermarket of the future to accommodate the new frozen foods as well as to provide the space for less

5/ "New Products on the Way," The Evening Star, October 3, 1963, Washington, D. C.

frequent but larger deliveries of frozen bakery products. More shelf space also will be required for displaying the many new dehydrated foods, since many of these concentrated products do not necessarily come in concentrated packages. Look at what has happened to the potato! This slide shows that the institutional and household consumer can find today 51 different kinds of processed potato products for sale. This does not include different brands but only different product categories. In 1957 when we made the market test for white potato flakes we found only 7 processed potato product categories on retail shelves.

Another outgrowth of increased emphasis on food processing innovations will be the impact on the size and location of processing facilities. The trend will be toward larger more fully integrated facilities which will tend to lower processing costs and allow for better quality control. We can almost predict with certainty that the new dehydration processing techniques will result in greater reductions in transportation and other marketing costs for foods which are produced relatively far from markets. Longer growing seasons which permit more specialized production and longer operation in processing plants with high fixed costs also will become more important in determining the location of new processing facilities. The West, particularly the Pacific coast area more fully meets the above criteria. As a result the West will likely gain more in the production of new processed foods relative to other regions.

One last thought about outlook. Many of us have talked about the "Golden 60's," but the sluggishness of our economy has tarnished the gold somewhat. However, population growth, the changing composition of the population, the greater amounts of disposable income available to consumers, plus the continued flow of new product and process developments in the food field, all may help restore some luster to the remaining years of the decade. These trends almost insure an optimistic outlook for the food industry, the consumer and maybe even the farmer.

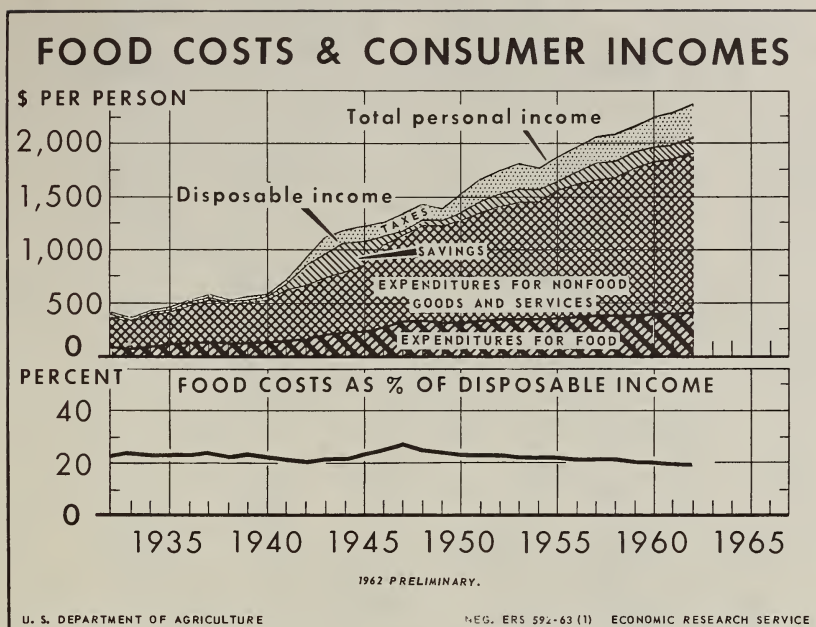


Figure 1

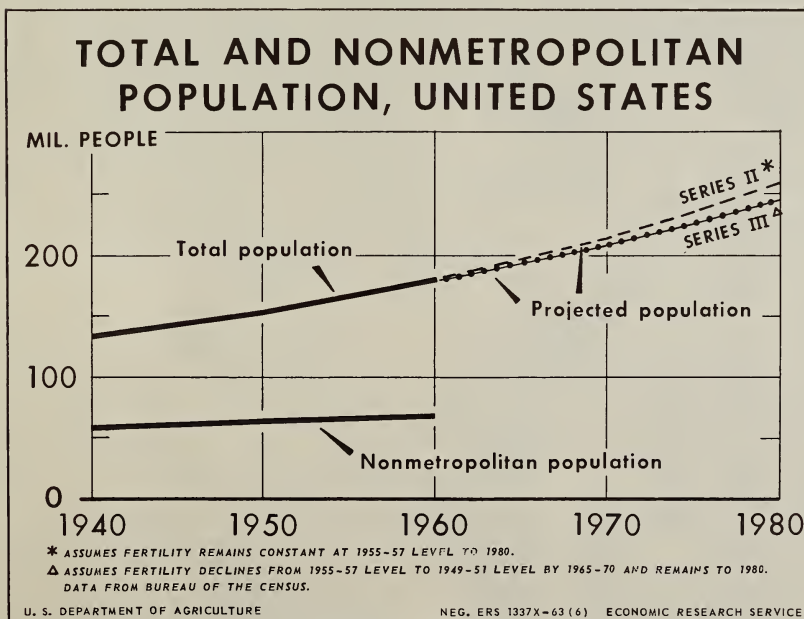


Figure 2

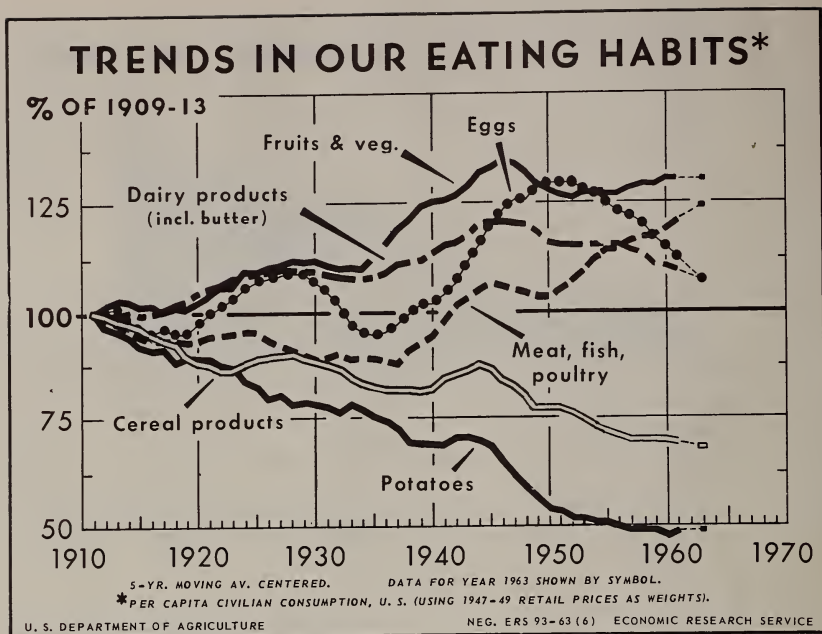


Figure 3

Table 1.--Effect of convenience foods on food costs per \$100 expenditure for all food in grocery stores 1/

Period	: U. S. Farm : : Foods : : Dollars	: Other <u>2/</u> : : Dollars	: Total : Dollars
12-months 1959-60			
Amount spent for convenience foods..	12.55	1.48	14.03
Cost of equal number of servings of: home-prepared.....	<u>12.82</u>	<u>2.28</u>	<u>15.10</u>
Difference.....	<u>-.27</u>	<u>-.80</u>	<u>-1.07</u>
September 1959			
Amount spent for convenience foods..	12.66	1.50	14.16
Cost of equal number of servings of: home-prepared.....	<u>12.94</u>	<u>2.30</u>	<u>15.24</u>
Difference.....	<u>-.28</u>	<u>-.80</u>	<u>-1.08</u>
September 1963			
Amount spent for convenience foods..	12.86	1.45	14.31
Cost of equal number of servings of: home-prepared.....	<u>13.47</u>	<u>2.19</u>	<u>15.66</u>
Difference.....	<u>-.61</u>	<u>-.74</u>	<u>-1.35</u>

1/ Adjustments were made for foods which were not available during all three periods to make the data comparable.

2/ Includes coffee, tea, fish and shellfish.